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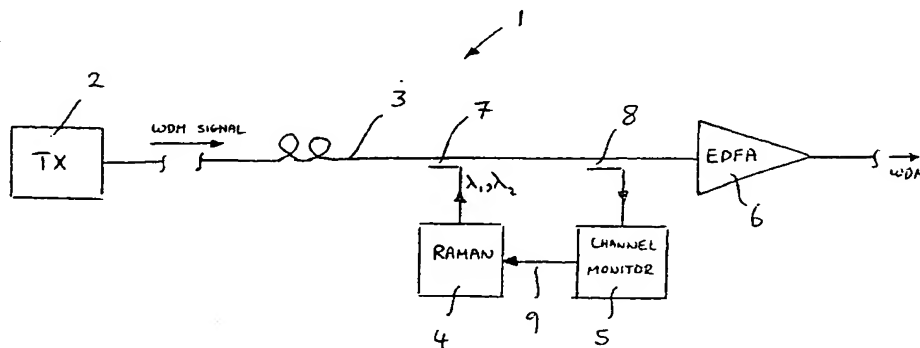
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(54) Title: RAMAN AMPLIFIER



(57) Abstract: A Raman amplifier for amplifying WDM radiation propagating along an optical fibre (3), said WDM radiation comprising a plurality of radiation components each having a selected waveband, comprises: a plurality of optical radiation generating means (10, 11) operable to generate pump radiation of a selected wavelength (λ_1 , λ_2) and power, said radiation being coupled into said fibre to optically amplify the WDM radiation. The amplifier is characterised by the optical radiation generating means (10, 11) being wavelength tuneable and means (5) for measuring the power of the radiation components of the WDM radiation after it has propagated along the fibre (3) and has been amplified. The wavelength and power of operation of the wavelength generating means are controlled in dependence upon the measured powers such as to make the measured powers substantially equal in magnitude and of a selected magnitude. To reduce polarisation dependent gain where the pump radiation propagates in a direction along the optical fibre that is counter to the direction of propagation of the WDM radiation, each radiation generating means (10, 11) preferably comprises a plurality of radiation sources (10a to 10c, 11a to 11b), preferably three, each one being operable to generate radiation having the same wavelength but with a different state of polarisation. Advantageously the three radiation sources (10a to 10c, 11a to 11c) are operable to generate radiation whose state of polarisation is shifted by 60° to each other and which are combined using a polarisation maintaining multiplexer (10d, 11d).



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